GROWTH PATTERN IN ACUTE LEUKEMIC CHILDREN

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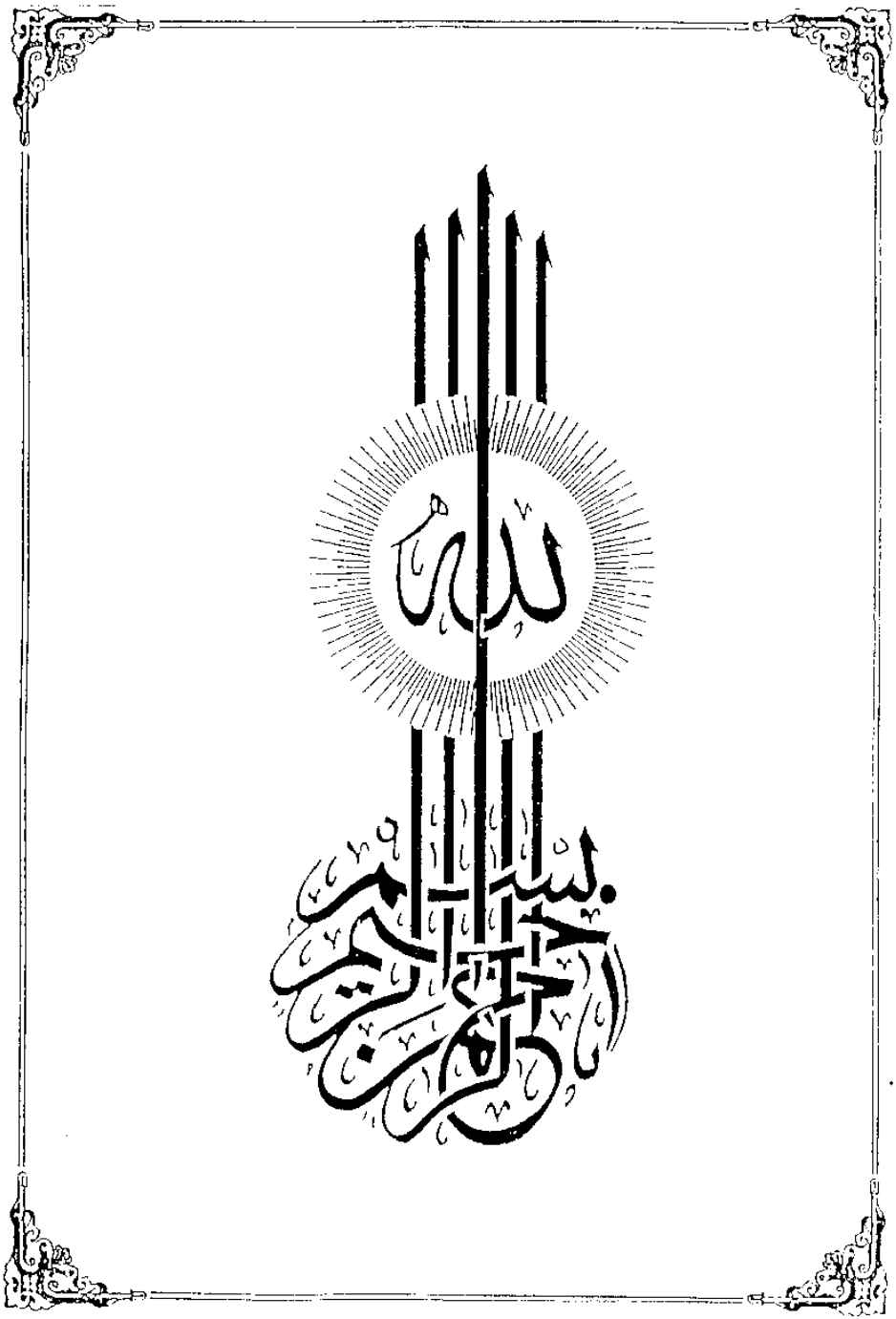

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INTRODUCTION

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Serious disease of any major organ or system can impair growth, such as cyanotic congenital heart diseases and blood diseases as chronic anaemias and leukemia (Abbassy et al., 1972).

Growth retardation in acute leukemia in infancy and childhood may be due to the disease itself and/or the anti-leukemic therapy (Swift et al., 1978).

Many children treated for acute leukemia achieve a prolonged remission and probable cure (Maure and Simone, 1976). This has been accomplished by using combined chemotherapy and central nervous irradiation (Hustu et al , 1973).

Prolonged administration of steroids has been shown to suppress linear growth and retard osseous development. Effects of other agents with anti-metabolic and immunosuppressive activities had not been well documented (Saunderman and Pearson, 1969).

Recent reports suggest that the children treated for acute leukemia may be at substantial risk of growth hormone

deficiency caused by the effect of central nervous irradiation (Shalet et al., 1976).

With the great advances made in the prognosis of children with acute leukemia, much more attention has been focused on the quality of their survival (Shalet et al., 1976). The knowledge must influence treatment and long term management, we have therefore studied the growth of leukemic patients.

AIM OF THE WORK

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The aim of the present study is to evaluate the general growth of patients with acute leukemia and their nutritional status and to study the effects of prolonged chemotherapeutic agents as well as irradiation on growth.

REVIEW OF LITREATURE

GROWTH

Growth may be defined as a change in size resulting from increase in the number as well as size of the cells of the body (Silver, 1980). Growth is not uniform throughout life. There are periods of rapid growth and others of slowing down of the rate of growth. The influencial factors in each period differ in their nature and/or the extent of their effects (Forfar, 1978).

Factors affecting growth:

The rate of growth at any age is the outcome of natural interaction between "intrinsic factors" within the individual's body and "extrinsic factors" surrounding the environment (Abbassy et al., 1972).

I- Intrinsic factors (organic factors):

1) Genetic factors: Effects of genetic factors on growth are very strong in the human (Falkner, 1977). The control of body size is certainly a complicated affair involving many genes, yet a disturbance in a single gene or a group of genes may produce a widespread and drastic effect as in the condition of achondroplasia (Sinclair, 1975).

Polani (1974) indicated that the size at birth relates about 18% to the genome of the fœtus, 20% to the maternal genome, 32% to the maternal environmental factors, and the remaining 30% to unknown factors. It was found that genes influence growth and development through the control of the production of the enzymes responsible for all chemical reactions that are necessary for building up and maturation of various cells and systems (Altenberg, 1957).

Racial factors: Racial influence is much interelated with genetic influence and it is difficult to assess when concomitant important environmental and nutritional factors are involved.(Falkner, 1977).

Tanner (1966) found that, there were racial differences in the rate and pattern of growth, leading to the racial variations in the adult body built. It is probable that genetic factors are largely responsible for such racial differences, though nutrition may also play an important part (Sinclair, 1975).

2) Endocrine glands: have an important and definite effect upon the physical, mental,and emotional growth and development of the child. The most important hormones that

influence growth and development are: growth hormone, thyroid hormone, insulin, glucocorticoids, and sex hormones (Abbassy, et al., 1972).

i- Growth hormone: is the single most important hormone stimulating growth after the second year of life, but it does not appear to influence maturation (Falkner, 1977). Its predominant effect on linear growth is exerted through stimulation of somatomedin production, apparently from the liver (Vandenbrande et al., 1974 and Tenore et al., 1977) and Kidney (Di-George, 1979). Somatomedin enhances the rate of mitosis in cartilage cells at the epiphyseal plate, without undue acceleration of osseous maturation (Vandenbrande et al., 1974).

× There is an antagonism between the production of somatotrophin and the production of cortisone by the suprarenal gland (Sinclair, 1975).

ii- Thyroid hormones: have a strong influence on later foetal growth and in the first year of life during these periods of growth and maturation (Falkner, 1977). Thyroid hormones are essential for normal energy metabolism and particularly important in relation to growth and maturation of the bones, teeth and brain (Sinclair, 1975).